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Mathew A. Casey, Esquire
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Attorneys at Law
Nineteenth Floor, 1525 Locust Street
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RE: *James H. Gorbey Jr., Adm. of the Estate of Marissa Rose Fishman v. Ashland Construction Company, Inc., et al*

Dear Attorney Casey:

At your request I have reviewed the following materials you have provided me in respect of the above matter: copy of the civil complaint; New Castle County Police Department report; Records of Marissa Fishman from Alfred I. Dupont Institute. Having reviewed this material I would offer the following brief comments on the cause of death of Marissa Fishman and the pain and suffering she endured consequent thereon.

Marissa Fishman was a healthy, active 20-month-old infant on August 30, 2002 who was visiting her grandparent's residence in Wilmington Delaware along with other family members including other children. This residence had a large patio and partly enclosed pool which was separated from the residence by a sliding glass door that would normally have been kept closed at all times while children were in the house. Unfortunately on this date a group of workmen were working in the patio area and left this door open with the sad result that Marissa was subsequently found floating lifeless in the pool a few minutes after the residents of the house noted her absence. Her mother dove into the pool and immediately retrieved Marissa and thereafter initiated cardiopulmonary resuscitation, which was continued by the first responding emergency medical personnel who transported her to Alfred I. Dupont Hospital. She arrived unresponsive and without vital signs with cardiopulmonary resuscitation in progress and after several rounds of resuscitation medications and further intensive resuscitative efforts, Marisa's heart began to beat spontaneously and she was transferred to an intensive care unit deeply unconscious and fully ventilator dependent. However, it was obvious that Marissa had sustained irreversible brain damage and she remained severely acidotic with multiple episodes of bradycardia that necessitated reintroduction of cardiopulmonary resuscitation until death was pronounced some nine hours after her retrieval from the pool.

Death can result from immersion in water by different mechanisms of which the most common is asphyxial drowning where the individual holds their breath for as long as possible but finally inhales water which displaces air from the airways and distal air sacs and permits free exchange between the blood in the pulmonary capillaries and the water in the alveoli. Since there is now little oxygen in the air sacs, the blood returning to the heart can no longer provide oxygen to be distributed to those organs in the body most in need of it, particularly the brain which by this time will have already been rendered extremely hypoxic, and death can occur from asphyxia by this mechanism.

A not uncommon phenomenon is that of so-called "dry" drowning where, on attempting to breathe cold water, the larynx responds to this noxious stimulus by contracting and closing the vocal cords over the tracheal inlet. This stops any water from entering the lungs but also stops any further exchange of oxygen with the blood circulating through the lungs and so death is caused by asphyxia.

Alternatively, and more rapidly, if one breathes in fresh water upon immersion in it this fresh water in the alveoli will rapidly begin achieving osmotic equilibrium across the alveolar membranes with the blood in the pulmonary capillaries diluting it and greatly altering the ionic concentrations in the blood now returning to and bathing the heart. Since the heart relies for its normal electrical function on a very strictly controlled ionic milieu this sudden change in that environment can result in an almost instantaneous fatal cardiac dysrhythmia within seconds of first inhaling fresh water and explains why some individuals who are retrieved within a minute of entering the water are found to be unconscious and in cardiorespiratory arrest within a time frame shorter than most individuals could simply hold their breath.

Statistically, the asphyxial modes of death make up the bulk of deaths by drowning and take at least a few minutes to cause death. Most healthy individuals can hold their breath for one to two minutes during which their brain responds to increasing hypoxia with an increasingly urgent sensation to breathe. Surprisingly, infants and young children still tend to reflexively hold their breath when immersed in water even if unable to understand the consequences of inhaling water. Individuals who remain submerged and unable to breathe quickly use up their available reserves of oxygen and begin to see spots and flashing lights, become dizzy and then faint into unconsciousness. This period of consciousness lasts in most people for one to two minutes but in a practiced breath holder can exceed even four minutes. Infants seem to be somewhat more resistant to hypoxia and their period of consciousness could be expected to be longer rather than shorter than the average. During this period of consciousness, while the affected individual is struggling at and just under the water's surface, it is noteworthy that very few victims of drowning seem to have been able to summon assistance and it is not surprising that no one heard Marissa cry out or make much of a disturbance in the water. Hence, there are many

instances of drowning in bodies of water such as public pools that are quite crowded with other people who have thus remained unaware of the drowning individual literally within feet of them. It would be normal behavior for a panic stricken young child, such as Marissa, to devote all of her energies to attempting to breath air rather than water and she was undoubtedly too young to know that she needed to attempt to float with her mouth and nose just above the water's surface and form a plan for propelling herself to the edge of the pool or even simply float and call for assistance even though it would have been rapidly available.

The sensation of wanting to breathe but being unable to do so is extremely distressing and within common experience. A 20 month old could be expected to experience the same level of pain and suffering during this period of struggling for breath as would any competent adult and although not as capable as an adult of contemplating her death as the expected outcome if she cannot succeed in drawing breath while in the water, she would nonetheless be as panic stricken at her inability to breathe as would any adult. There was no reason to indicate that Marissa would not have been as frantic and panic stricken as any conscious individual in the same circumstances.

It is therefore my opinion offered within a reasonable medical certainty and in light of my training, education and experience that Marissa Rose Fishman most probably suffered one to two minutes of extreme air hunger as she struggled at the water's surface and started to drown with its consequent pain and suffering and the increasing panic and terror that could be expected to consume a 20 month old even if not capable of contemplating that their life was coming to an end. I hope these opinions and observations are of assistance to you.

Yours truly,



Ian C. Hood, MB,ChB, J.D., Forensic Pathologist
for Forensic Pathology Consultants, Inc.